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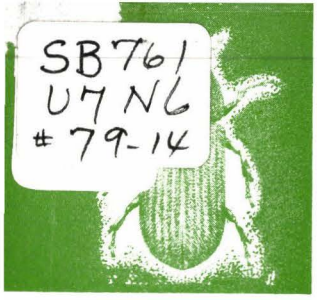

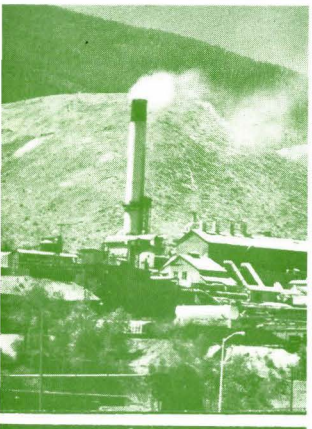

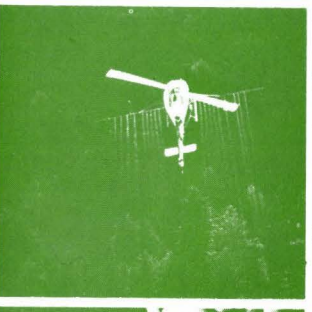

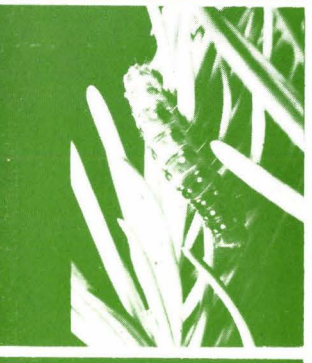

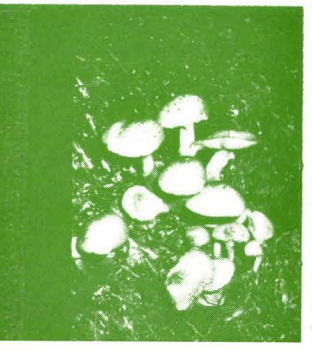

FOREST INSECT & DISEASE MANAGEMENT

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A DEMONSTRATION OF LODGEPOLE PINE MANAGEMENT TO PREVENT MOUNTAIN PINE BEETLE OUTBREAKS YAAK AND THOMPSON RIVER DRAINAGES

PROGRESS REPORT

BY

M. D. McGregor, Entomologist

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INTRODUCTION

The mountain pine beetle remains the major international mortality factor of lodgepole pine--spanning western United States and Canada. In every insect and/or timber loss review conducted, the mountain pine beetle is consistently ranked at the top of the list. It is estimated that over 90 percent of the lodgepole pine stands in the West where climate is conducive to brood survival, have had epidemic mountain pine beetle infestations.

Extensive knowledge has been developed for preventing mortality in lodgepole pine stands. Since it is virtually impossible to control epidemic mountain pine beetle populations, management is being directed toward prevention with emphasis toward green stands while salvaging infested stands.

Through proper management, extensive mortality of lodgepole pine can be prevented by changing the mountain pine beetle food supply and manipulating stands to grow at or near optimum site capacity compatible with other land management objectives.

This is a cooperative demonstration with the Lolo National Forest, Kootenai National Forest, Region 1; Forest Insect and Disease Management, Region 1 and Research Work Unit 2201, Intermountain Forest and Range Experiment Station. Treated stands will be reviewed and inspected by interested parties.

OBJECTIVES

This demonstration has the following objectives:

1. Apply recommended cutting strategies prior to beetle infestation to prevent an outbreak from developing; and reduce an infestation that has developed to epidemic status by changing the stand dynamics.

2. Manage through regeneration and postcut techniques to obtain maximum wood and fiber production.

3. Develop knowledge on beetle/host tree interactions and consequences in these managed stand situations.

4. Manage forest cover to attain full potential for timber production consistent with key values and soil and water objectives. This objective implies desirable stocking levels of disease-free growing stock of desired species.

METHODS

An area of approximately 2,000 acres was selected on each Forest for this demonstration. Each area was divided into 24 units of 15-20 acres. Each unit will receive a cutting strategy. Adjacent lodgepole pine stands are designated as check areas.

Prior to cutting each unit was cruised to obtain estimates of number of infested trees. These were obtained by establishing 40 1/4-acre plots at 5-chain intervals

throughout each block. A hypsometer was used to determine if trees were within plot boundaries. Each infested tree 5 inches in diameter at breast height (d.b.h.) and larger was recorded by d.b.h. and categorized into one of the following classes:

0 = Green, uninfested.
1 = 1978 attack.
2 = 1977 attack.
3 = 1976 or prior attack.
4 = Unsuccessful attack or pitchout; green foliage, pitchtubes present, brood and blue stain absent.
5 = Strip attack.

In addition, twenty 1/10-acre plots were established to determine diameter-phloem distribution within the stand. A hypsometer was used to determine trees to be tallied within plots. Each tree tallied was recorded by d.b.h.; and two phloem samples were removed from opposite sides of each of two trees in each diameter class per plot. Phloem thickness was measured to the nearest one-hundredth of an inch with a steel ruler.

Additional data collected was:

1. Site index
2. Habitat type
3. Elevation
4. Age and growth rate
5. Basal area, stems/acre
6. Aspect
7. Slope
8. Crown competition factor

One year's data has been collected by INT-RWU 2201 concerning:

1. Associated insects.
2. Emigration/immigration of mountain pine beetle at different crown levels.

RESULTS

All units are established and cruised. Nine units have been logged on the Yaak Demonstration Area, the remainder (10 units) will be logged by November 1, 1979.

Problems have arisen in getting the Thompson River drainage units logged, but these will be logged by December 1, 1979.

All units will be recruised following logging and beetle flight 1979. Data on mountain pine beetle infestation intensity will be available from pre to postlogging for comparison. Results of prelogging data are shown in tables 1 and 2.

Table 1.--Unit information; Yaak River drainage, Sylvanite Ranger District, Kootenai National Forest - 1978

Unit No.		Designated cut	Acres	Attacks/acre 1976	1977	1978	Logged MBF
Waper Ck	1	leave >12	20	7.6	6.4	15.6	306.0
	2	100BA	16	4.4	1.6	2.4	64.0
	3	80BA	14	6.4	3.6	5.0	58.0
	4	Check	25	4.6	0.4	7.6	
Hensley Ck	1	Cut ≥10	17	7.2	3.8	3.6	226.0
	2	120BA	16	11.2	2.0	3.4	206.0
	3	80BA	18	2.6	1.6	0.4	86.0
	4	Cut ≥12	10	2.8	0.6	3.2	208.0
	5	Cut ≥12	14	4.8	0.4	2.0	86.0
	6	Cut ≥7	18	1.8	0.2	0.4	323.0
	7	Cut ≥12	21	0.8	3.8	13.2	106.0
Benefield Ck	1*	Cut ≥7 in.	16	1.2	0.4	0.2	207.0
	2*	120BA	28	0	0	0	62.2
	3*	100BA	19	0.4	0.4	0.2	117.0
	4*	80BA	16	1.6	0	0.2	17.1
	5*	Cut ≥10 in.	16	0.8	1.2	4.4	157.9
	6*	Cut ≥10 in.	18	0	0.2	0	87.9
	7*	100BA	14	8.8	1.4	17.2	145.9
	8*	120BA	18	0.6	1.8	1.6	173.9
	9*	Cut ≥7 in.	17	0.6	0.8	0.2	177.7
	10	Check	23	2.2	5.2	10.8	
	11	Check	25	6.0	7.2	16.4	

*These units are harvested.

Table 2.--Unit information; Thompson River drainage, Plains Ranger District, Lolo National Forest - 1978

Unit No.	Designated cut	Acres	Attacks/acre 1976	1977	1978	Volume logged/MBF
14	Cut >7 in.	15	7	22	89	210
15	Cut >7 in.	25	16.4	67.8	127.2	200
19	Cut >7 in.	31				627
4	Cut >10 in.	19	0.2	1.0	4.2	
7	Cut >10 in.	21	0.6	0	1.6	
16	Cut >10 in.	20	3.4	13.0	40.2	
2	Cut >12 in.	17	0	0	3.6	
3	Cut >12 in.	17	0.2	1.0	4.2	
8	Cut >12 in.	15	0.2	0.4	0.2	
1	80BA	15	0.4	0.8	0.2	
30	80BA	15	0.2	0	0.4	
33	80BA	15	0	0	0	
9	100BA	18	1.4	1.6	4.8	
11	100BA	15	0	0	0	
13	100BA	22	0.6	1.4	0.2	
6	120BA	17	0.2	0.8	1.4	
17	120BA	15	0.6	0	2.6	
21	120BA	15	0	0.2	1.6	
7	Check	21	0.6	0	1.6	
18	Check	15	0.6	1.0	5.8	
27	Check	21	67.0	63.0	8.4	